

CLAIMS

- 1.** A polymer dispersion comprising an aqueous, continuous phase and dispersed particles of polyurethane, which is based on organic, non-aromatic isocyanates with a functionality of at least 2, said polyurethane having a high degree of crystallinity and whose crystalline phase has a melting point between 25 and 70°C, and a copolymer and/or terpolymer having a T_g (glass transition temperature) between -20 and +50°C obtainable by emulsion polymerization of ethylenically unsaturated monomeric materials containing only C, H, O and/or N atoms, which monomeric materials comprise from 0.5 to 15 percent on the total of monomeric materials of monomers containing at least one nitrile group, in a weight ratio between 50:50 and 10:90 (polyurethane to emulsion polymer), in which the particles of the dispersion are in the form of multiphase particles comprising said polyurethane and said copolymer and/or terpolymer and which dispersion is obtainable by emulsion polymerisation of the monomeric materials in the presence of the polyurethane dispersion, said eventual polymer dispersion having a solids content of 30 to 70%.
- 2.** A polymer dispersion according to claim 1, in which the copolymer and/or terpolymer produced by emulsion polymerization of ethylenically unsaturated monomeric materials comprising vinyl- and/or acrylic and/or methacrylic monomers the monomeric material optionally comprises up to 10%, preferably 0.5 to 7% on the total amount of monomeric materials of at least one monomeric material selected from the of the group consisting of monomeric materials comprising an aceto acetoxy group and/or a hydroxyl group, with the hydroxyl group preferably as a methylol group.

3. A polymer dispersion according to claim 1, in which the copolymer and/or terpolymer produced by emulsion polymerisation of ethylenically unsaturated monomeric materials comprising vinyl- and/or acrylic and/or methacrylic monomers the monomeric material containing at least one nitrile group is acrylonitrile and/or methacrylonitrile in an amount of 3 to 12% by weight on the total amount of monomeric materials.
5
4. A polymer dispersion according to claim 2, in which the monomeric material comprising an N-methylol group comprises N-methylolacrylamide and/or N-methylolmethacrylamide in an amount of from 0.5 to 7% by weight on the total amount of monomeric materials.
10
5. A polymer dispersion according to a preceding claim in which copolymer and/or terpolymer produced by emulsion polymerization of ethylenically unsaturated monomeric materials materials comprises:
15
75 to 98.9 % by weight of, preferably 81 to 96.5 % by weight of, monomers which are C1 to C18 alkyl esters of acrylic and/or methacrylic acid,
1 to 15 % by weight, preferably 3 to 12 % by weight of monomers containing at least one nitrile group, preferably acrylonitrile and/or methacrylonitrile,
20
0.1 to 10 % by weight, preferably 0.5 to 7 % by weight, of monomers comprising a hydroxyl group and/or an aceto-acetoxy group, preferably N-methylolacrylamide and/or methacrylamide and/or acetoacetoxyethyl(meth)acrylate.
25
6. A polymer dispersion according to a preceding claim, in which said polyurethane is obtainable by the condensation reaction between a polyol and an excess organic, non-aromatic isocyanate with a functionality of at least 2, followed by chain extension with a diamine and/or polyamine.

7. A polymer dispersion according to claim 6, in which said organic non-aromatic isocyanate with a functionality of at least 2 comprises 1,1'-methylenebis(4,4'-isocyanato)cyclohexane, (H12MDI) and/or 1,6-hexanediiisocyanate, (HDI) and/or isophorone diisocyanate, (IPDI).
5
8. A polymer dispersion according to claim 6, in which said polyol is a polyester based polyol or a polyether based polyol .
10
9. A polymer dispersion according to a preceding claim, in which said polyurethane has a melting point in the range of 30 to 60°C as determined by Differential Scanning Calorimetry (DSC) as described herein before.
15
10. A polymer dispersion according to a preceding claim, in which the pH of the aqueous phase is between 4 and 9, preferably between 6 and 8.
15
11. A polymer dispersion according to a preceding claim, in which the aqueous phase contains as an emulsifying agent a nonionic and/or an anionic surfactant.
20
12. A polymer dispersion according to a preceding claim, in which the solids content is of 30 to 70%, the Brookfield viscosity determined with spindle 3 at speed 20 rpm is less than 1.0 Pa.s at a temperature of 23°C, and the average particle size is less than 0.5 µm (micron) as determined by laser light scattering using a Malvern Mastersizer.
25
13. The use of a polymer dispersion according to a preceding claim optionally in the presence of 0.1 to 10% by weight of an isocyanate with an average functionality of at least 2, or such an encapsulated isocyanate or an oxazoline as a heat seal laminating adhesive, preferably for 3-D laminating.
30

14. The use of a polymer dispersion according to a preceding claim, in which on a substrate comprising wood, plastic, textile or a wood product, a foil or foam is laminated, preferably a PVC foil on MDF board.

5 **15. Articles wholly or partially consisting of a polymer material as defined in anyone of the preceding claims 1 to 12.**

16. The use of a polymer dispersion as claimed in any one of the claims 1-12 as a size for glass fibre